

A new species of *Arabidella* (Brassicaceae) from Western Australia

Juliet A. Wege¹ and Brendan J. Lepschi²

¹Western Australian Herbarium, Department of Environment and Conservation, Locked Bag 104, Bentley Delivery Centre, Western Australia 6983

²Australian National Herbarium, Centre for Plant Biodiversity Research, GPO Box 1600, Canberra, Australian Capital Territory 2601

Abstract

Wege, J.A. & Lepschi, B.J. A new species of *Arabidella* (Brassicaceae) from Western Australia. *Nuytsia* 17: 453–458 (2007). *Arabidella chrysodema* Lepschi & Wege is described as new. Named for its widespread distribution in the Goldfields region of southern Western Australia, this species differs from others in the genus in being an herbaceous annual with pinnatifid leaves and a narrowly elliptic to narrowly oblong siliqua. Photographs and a distribution map are provided along with a key to the species of *Arabidella*.

Introduction

Arabidella (F.Muell.) O.Schulz. is a small genus endemic to arid and semi-arid regions of Australia and characterised by yellow to white petals, dehiscent siliquas, finely papillose and mucous seeds, an embryo with incumbent cotyledons, and hairs that are simple, papillose or altogether lacking (Shaw 1965; Hewson 1982). There are six described species (three shrubs and three herbaceous annuals), two of which are recorded for Western Australia: the shrubby *A. trisecta* (F.Muell.) O.Schulz and the herb *A. nasturtium* (F.Muell.) E.A.Shaw. The former is widespread in the south-east of Western Australia, as well as occurring in other mainland states of Australia. *Arabidella nasturtium* has a similarly wide distribution but is poorly known in Western Australia, to the extent that there are no collections housed at the Western Australian Herbarium (PERTH). Shaw (1965: 194) does, however, cite two collections from Western Australia under this species, one of which is housed at the State Herbarium of South Australia (AD), the other at the National Herbarium of Victoria (MEL). The AD specimen (Giles, Rawlinson Range, *Cleland s.n.*) is confirmed by us as *A. nasturtium*; however, the MEL specimen (7 miles SW of Kalgoorlie, *Kemsley s.n.*) differs from *A. nasturtium* in its leaf and siliqua morphology. Whilst Shaw (1965: 195) noted this collection was unusual, she was uncertain if it represented a distinct taxon, stating that further collections were needed. A number of comparable collections from the Goldfields of southern Western Australia have since come to hand and it is clear that they represent a new and distinct species, formally described herein.

Methods

This study is based on herbarium specimens housed at PERTH, CANB and MEL. No living material

was examined. Flowers from the following collections were reconstituted in a hot detergent solution and examined for critical features: *R.J. Cranfield* 10028, *G.J. Keighery* 2985, *N. Gibson & M. Lyons* 3373 and *P.G. Wilson* 7183. The distribution map was compiled using DIVA-GIS freeware Version 5.2.0.2 and is based on PERTH specimen data.

Taxonomy

Arabidella chrysodema Lepschi & Wege, *sp. nov.*

Species haec ab *Arabidella procumbenti* (Tate) E.A. Shaw plantis erectis vel decumbentibus, petalis longioribus, stylo longiore, et siliqua brevior et latior differt.

Typus: 30 km south-west of Kalgoorlie on road to Coolgardie, Western Australia, 26 August 1968, *P.G. Wilson* 7183 (*holo*: PERTH 03242250 (sheet 1), PERTH 05935881 (sheet 2); *iso*: AD, CANB).

Arabidella sp. Goldfields (*P.G. Wilson* 7183), in *G. Paczkowska & A.R. Chapman*, West. Austral. Fl.: Descr. Cat. p. 185 (2000).

Annual herbs, (2.5–)8–40 cm high, becoming multi-stemmed. *Stems* erect to decumbent, 6–30(–40) cm long, terete, glabrous. *Basal leaves* rosulate, pinnatifid, more rarely lobate or subentire, 2.0–4.5 cm long, glabrous; lateral lobes of pinnatifid leaves 2 or 3 (more rarely 4) per side, evenly spaced, mostly oblong or triangular, opposite or subopposite; terminal lobe oblong to narrowly obovate. *Cauline leaves* alternate, similar to basal leaves but gradually becoming smaller up the stem, 0.5–3.3 cm long, absent on primary stem. *Inflorescence* initially corymbose, becoming racemose as siliques develop; flowering pedicels sub-erect to erecto-patent, 3–10 mm long. *Sepals* slightly dimorphic, 2.2–2.6 mm long. *Petals* yellow, 3.0–3.6 mm long. *Stamens* 6. *Ovary* narrowly elliptic, glabrous or transiently papillose; stigma depressed capitate, broader than style. *Fruiting pedicels* erecto-patent to spreading, (4–)7–15 mm long. *Siliqua* mostly less divergent than pedicel, narrowly elliptic to narrowly oblong in profile, usually slightly more tapered at base, somewhat compressed parallel to septum, 4–7(–8) mm long, 1–2.5 mm wide; valve convex, with midvein distinct; style 0.3–0.7 mm long. *Seeds* biseriolate, ovate to elliptic in profile, slightly compressed, 0.6–0.8 mm long, finely papillose. (Figures 1, 2)

Specimens examined. WESTERN AUSTRALIA: 3 Mile Hill, Coolgardie, Aug. 1965, *J. Bale* 92 (PERTH); 62 km E of Norseman on Eyre Highway, 16 Aug. 1995, *R.J. Cranfield* 10028 (PERTH); 98.9 km NE of Balladonia Motel, 13 June 2000, *R. Davis* 9382 (PERTH); on broad flats N of Aurora Range, c. 9.5 km NE of Bungalbin Hill, 23 Sep. 1995, *N. Gibson & M. Lyons* 3369 (PERTH); flat north of range, c. 9 km NE of Bungalbin Hill, 28 Sep. 1995, *N. Gibson & M. Lyons* 3373 (CANB, PERTH); Woodline, 16 km N of camp, 7 Aug. 1980, *G.J. Keighery* 2985 (PERTH); Coolgardie Road, c. 7 miles SW of Kalgoorlie, 12 Aug. 1951, *D. Kemsley s.n.* (MEL); 25 km ESE of Sinclair Soak, c. 80 km NE of Norseman, 11 Aug. 1980, *K.R. Newbey* 8291 (PERTH); 6 km W of Kambalda West, 9 Aug. 1981, *K. Newbey* 8474 (PERTH); 10 km NE of Bungalbin Hill, c. 57 km NNE of Koolyanobbing, 8 Sep. 1984, *K.R. Newbey* 10819 (PERTH); Bull Oak Dam, 79 miles S of Zanthus, 16 May 1971, *K. Thiess s.n.* (PERTH); Eyre Highway, 23 miles E of Fraser Range, 6 Sep. 1963, *J.H. Willis s.n.* (MEL).

Distribution. Largely confined to the Coolgardie region of southern Western Australia, extending to the eastern margin of the Nullarbor Plain, north-east of Balladonia (Figure 3).



Figure 1. Sheet 2 of the holotype of *Arabidella chrysodema* (P.G. Wilson 7183), scale bar at 5 cm.



Figure 2. *Arabidella chrysodema* (holotype: P.G. Wilson 7183). A – leaves, a progression from base to upper cauline (L to R), scale bar at 1cm; B – a silique i) prior to dehiscence, ii) at an early stage of deshiscence, iii) with one valve and seeds removed to reveal the replum, iv) with both valves fallen but with the replum and some seeds remaining, seeds biserially arranged, scale bar at 1mm.

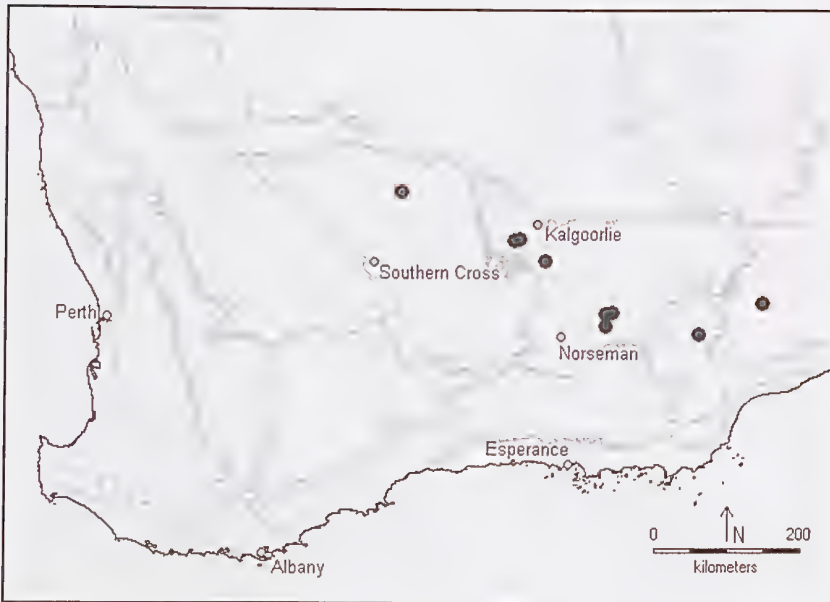


Figure 3. Distribution of *Arabidella chrysodema* in southern Western Australia. Version 6.1 IBRA regions (Department of the Environment and Water Resources 2007) are indicated in grey.

Habitat. Growing in red to brown clay or clay loam on flats (R.J. Cranfield 10028, R. Davis 9382) that may be adjacent to banded ironstone formations (N. Gibson & M. Lyons 3369, N. Gibson & M. Lyons 3373, K. Newbey 10819). Mostly recorded from mallee woodland over shrubland or dense herbs, with a single record for *Eragrostis setifolia* grassland (R. Davis 9382).

Phenology. Flowering and fruiting from June to September.

Conservation. The known populations of *A. chrysodema* span a distance of nearly 500 km and collectors' notes indicate that this species is present in healthy numbers at several sites. No conservation code is warranted.

Etymology. The specific epithet is derived from the Greek (*chrysos* – gold; *demos* – district) and refers to this species' widespread distribution in the Goldfields region of southern Western Australia.

Affinity. On the basis of leaf morphology, *A. chrysodema* appears most similar to *A. procumbens* (Tate) E.A. Shaw. The latter species differs in its prostrate habit, sessile primary inflorescence, smaller flowers with shorter petals (1.4–2.2 mm long), shorter mature style, and longer (9–14(–17) mm), narrower (0.7–1.2 mm) siliquas. *Arabidella procumbens* is not known to occur in Western Australia; it has been recorded from the southern Northern Territory, South Australia and north-western New South Wales (Council of Heads of Australasian Herbaria 2007).

Key to the species of *Arabidella**

1. Herbs, with basal leaves persisting into anthesis
 2. Stems pubescent **A. eremigena**
 - 2: Stems glabrous
 3. Leaves mostly pinnatisect or bipinnatisect; leaf segments mostly linear and with length:width ratio predominantly >10 **A. nasturtium**
 - 3: Leaves mostly pinnatifid; leaf segments triangular, oblong or elliptic and with length:width ratio <10
 4. Primary inflorescence on a peduncle several centimetres long; petals 3–3.6 mm long; fruit narrowly elliptic to oblong, 4–6(–8) mm long, 1–2.5 mm wide; style 0.3–0.7 mm long..... **A. chrysodema**
 - 4: Primary inflorescence sessile (i.e. with peduncle undeveloped); petals 1.4–2.2 mm long; fruit linear, 9–14(–17) mm long, 0.7–1.2 mm wide; style <0.1 mm long or obsolete..... **A. procumbens**
- 1: Shrubs, with basal leaves lost before anthesis
 5. Most or all leaves entire **A. filifolia**
 - 5: Most leaves pinnatisect
 6. Inflorescences elongating before the flowers open (i.e. open flowers occur well below the apex); fruit with length:width ratio >10, 0.8–1.3 mm wide **A. trisecta**
 - 6: Inflorescences elongating after the flowers open (i.e. open flowers occur at the apex); fruit with length:width ratio <10, 1.5–2.5 mm wide..... **A. glaucescens**

*Two additional informal taxa of *Arabidella* are recognised in eastern Australia, *A. sp. Eurella* (S.L. Everist 3734) Qld Herbarium and *A. sp. Tibbooburra* (R.G. Coveny 13552) NSW Herbarium (Council of Heads of Australasian Herbaria 2007). These taxa appear to be related to the shrubby members of the genus, but their taxonomic status is uncertain and they are not considered further in this study.

Acknowledgements

This paper was funded through the Western Australian Government's 'Saving Our Species' biodiversity conservation initiative. Thanks are extended to staff of the National Herbarium of Victoria, Northern Territory Herbarium, Queensland Herbarium, State Herbarium of South Australia and the Western Australian Herbarium for their assistance, and to Ian Thompson for his helpful comments on the manuscript.

References

- Council of Heads of Australasian Herbaria (2007). Australian Plant Census. Centre for Plant Biodiversity Research: Canberra. <http://www.anbg.gov.au/chah/apc/index.html> [accessed 19 February 2007]
- Department of the Environment and Water Resources (2007). IBRA Version 6.1. <http://www.environment.gov.au/parks/nrs/ibra/version6-1/index.html>. Updated 6th February 2007. [accessed June 2007]
- Hewson, H.J. (1982). *Arabidella*. In: A.S. George (Ed.) "Flora of Australia." Vol. 8, pp. 334–338 (Australian Government Publishing Service: Canberra.)
- Shaw, E.A. (1965) Taxonomic revision of some Australian endemic genera of Cruciferae. *Transactions of the Royal Society of South Australia* 89: 145–253.
- Western Australian Herbarium (1998–). FloraBase – The Western Australian Flora. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au> [accessed 19 February 2007]